

Instructor's Guide to the Professionalism & Ethics Toolkit v3

Welcome! This toolkit aims to give you everything you need to help give your cybersecurity students professional and ethical skills that go beyond just the screen. Cybersecurity has risen to be a critically important field, and with that comes a call to duty and ethics that help develop the person as a whole. We hope that with this toolkit you will find ideas, material, suggestions, etc. that will help you implement, develop, create, and cultivate courses, material, and guides to develop your soon to be cybersecurity professionals into ethical, conscientious professionals that can impact the world for the greater good.

By using this toolkit, you are in no part required to use everything, and you are not obligated to agree to/with everything in this toolkit. You are allowed to pick and choose what you want/need to help better your students for a career beyond college.

We are always looking for feedback to help make this toolkit stronger and more accessible for every college, university or even industry that would like to invest in their employees' development.

You can provide feedback to improve the toolkit at this form below:

<https://forms.gle/z8JtnMYcjMxNQA26A>

Cybersecurity is a community, and we hope that our contribution to the community can help not only the present community, but those who are looking for a future in the industry. To this, we have also included Montreat's Cybersecurity Oath and the NCAE Student Professionalism Ethics Code of Conduct.

We do ask that you take a moment to look/read over the Competencies folder, it may make the entire effort of this toolkit make sense. There is information and material there that really connects the efforts of academia to the understanding of the student before letting them out into the world. It may even help guide your efforts and ideas for future classes.

*Links includes Career Videos currently updates to these will be present at the listed links

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Table of Contents

Instructor Guide for Case Studies	4
Welcome!	4
Overview	4
How-To	4
Instructor Guide for Competencies	6
Welcome!	6
Overview	6
How-To	6
Instructor's Guide to Cyber Competitions	8
Welcome!	8
Overview	8
How-To	8
Instructor Guide to Finishing School	12
Welcome	12
Overview	12
How-To	12
STAR Method	13
Instructor's Guide to Links	14
Welcome!	14
Overview	14
How-To	14
Instructor's Guide for Professionalism & Ethics Course	15
Welcome!	15
Overview	15
How-To	15
Instructor's Guide to Supplemental Material	17
Welcome!	17



Overview	17
How-To	17
Instructor's Guide to Workshops	18
Welcome!	18
Overview	18
How-To	18



Instructor Guide for Case Studies

Welcome!

Case studies provide a lot of opportunities for students to work on their critical thinking! To that end, we have worked and are still working on creating case studies for you to use in class, groups, team practices, etc. You can add as much of a technical element as you wish, or if you want to simply use it for a round table discussion, then by all means feel free!

Overview

Case studies provide an excellent way for students to discuss and wrestle with decisions made and not made when it comes to the technical world around us. This is a collection of case studies developed by Dr. Wells & Dr. Tippey from Montreat College but will grow as the toolkit continues to develop from various sources.

Case studies have been used as discussion pieces within the class and as assignments for reports that challenge the students to dive deeper and decide on the steps taken or not taken. This should allow students to explore their own ethics and how they could apply them in a working environment.

As an instructor, you can decide on the best way to incorporate it into your classes and curriculum. You may even look at these as examples to challenge your students to build their own case studies (be sure to try and minimize biases with this approach).

What you want to look for in using case studies is the discussion and challenge of their own ethics as well as expanding their worldview through these discussions.

How-To

Again, it is entirely up to you as the instructor to decide how to implement these case studies into your curriculum or your class/activity. Montreat has incorporated case studies such as these into some of our classes to have our students wrestle with the numerous studies, considering various alternatives, and then deciding on what course of action they would recommend and why.

We guide our students using a 4-step ethical decision making, that is also found in more depth in micromodule 10 of the Professionalism & Ethics Course, to help students structure their response. There are other methods of ethical reasoning, and you are free to apply whatever approach would be the most beneficial to your teaching, goals, or expectations. The 4-step ethical decision-making process that has been used at Montreat follows as below:

1. Get the Facts



- a. We encourage students to ask questions, hear both sides of the story, and remove non-important information.
2. Define the Problem
 - a. Students must then define the problem, the actual problem as opposed to what was simply stated.
 - b. If you are looking at professional resolutions for a conflict. For example, a verbal conflict between two coworkers may reveal a lot of unnecessary details, but the problem may lie in one coworker feeling unappreciated or overlooked.
3. Evaluate Alternatives
 - a. Students then weigh out various alternatives, listing and explaining them as well as their rationale for why it is a solution.
4. Choose and Act Responsibly
 - a. Finally, students restate the true problem, provide the facts, and then explain the appropriate resolution going forward.
 - b. Students may also include negative consequences. Not every solution will be completely positive, but it may be necessary to move forward.

Oftentimes, these are case study papers, but you may find it allowing students to present or discuss the case studies and how they resolve it to be equally or more beneficial. It is also common for students to refer to specific ethics in their rationale for how they approach these issues. Approaches to ethics are also discussed in micromodule 10, and they include:

- Virtue/Character
- Rule/Deontological
- Consequentialist/Teleological

Of course, there are many more ethical approaches that may apply to various case studies. The goal is for students to approach these cases professionally with ethics in mind.



Instructor Guide for Competencies

Welcome!

Competencies are a great way for students to develop a better understanding of their own skills and how they can communicate with them. They serve 3 crucial purposes:

1. Give students a better understanding of what is expected of them in whatever job role they plan to be in/go for
2. Give employers a common language to speak in
3. Give educators a foundation to teach from and to

As competencies are now a requirement for redesignation, we felt it would be nice to provide some resources on competencies as well as linking them to other great work being done to develop this area.

Overview

What is competency? A competency is defined as (and used in this context for us):

“Competency is the ability for the student to complete a task in the context of a work role.”

Essentially, being competent (per our definition) means to successfully complete a task an organization or person would pay someone to do. It is important to note that competencies are not here to replace what you do as an instructor or organization. Instead, the hope is that competencies can come alongside the work that you already do to provide a new way for students to view what they do and how they communicate about that. It is our hope that we can have conversations with industry as well, so everyone speaks the same language and can communicate more effectively. The definition of competency, and by extension what it means to be competent in our industry, is extremely important and should be defined when talking about them so that we are all working with the same foundational understanding.

How-To

Reminder, competencies and competency statements are not intended to replace anything that you are doing as an instructor. If anything, it may help frame what you do and help students understand why it is important that they put forth an earnest effort in accomplishing the tasks at hand. It has been our experience talking with students about what competencies are and how they relate to the work they will do throughout their time at the institution to be encouraging and, depending on the task, exciting. Students can then relate what they are doing in the classroom to what they are doing in the workplace much more easily.



This guide will not go into depth about what competencies are or how to create a competency statement. There are resources linked in the toolkit for that as well as many in the CAE community available for you to reach out to for any questions. Instead, this guide will discuss how one may approach using competencies in their institution and beyond.

Within the classroom, a competency statement can lead to an assignment that is already being done that could make a solid competency statement. There are several examples of competency statements and competency inspired assignments within the toolkit, free for you to review and use if you'd like. Including what framework (NICE or DWCF) you pull the task from to build your assignment and explaining this to your class has had a positive impact on coursework and even questions from students. We hope that you will have a similar experience if you decide to pursue this route.

Additionally, extracurricular activities that may relate to professions within the cybersecurity field would also be great to develop competency statements from. Cybersecurity clubs, outreach activities, workshops, internships, etc. can all provide excellent competency statements. In the case of internships or student lead activities, encourage and help the student to build a competency statement. This helps them reflect on the work they have done and how they can communicate/mimic that work to help train others as well as assisting in developing required competency statements for your institution.

The work for competency statements does not begin or end at the institution. When opportunities arise, we do encourage you to speak to industry leaders, partners, or coworkers about competencies. Share with them the competency statements that you build and ask if the task as designed would:

1. Build those professional skills, in their professional opinion.
2. Be something that an organization like theirs or similar would pay for.
3. Be something that they, if in the same or similar role, may do, have done or would like to see done at their place of work.

This provides more validity to the competency statement not just for redesignation but for explaining to students why their work and their ability to communicate their work.

Of course, be sure to share your competency statements with the CAE community!



Instructor's Guide to Cyber Competitions

Welcome!

This section of the toolkit aims to give you ways to implement professionalism and ethics into your competition. There are several competitions here that can be run as written.

Cybersecurity competitions are often considered just technical. While this is great, it often leaves out the part that professionals need. Adding a few injects requiring professionalism helps, but there is a lot more that businesses and corporations need. Our hope is that these ideas, suggestions, and materials will help you make your competition as engaging and beneficial to students as possible!

Overview

Cyber competitions are an excellent way to not only have students learn more of the various technical concepts, but to put into action what they have been learning and practicing in a classroom environment to something more akin to an actual working environment. Competitions can bring out surprising results from students when given the opportunity to highlight their skills; however, what this portion of the toolkit aims to remedy is these skills being limited by one's inability to either explain, lead, or follow an organization's policies. Within this section of the toolkit, you should see 4 different directories: Out of Box Competitions, CTF Ethics, Team Ethics and Professionalism, and Network Ops Challenge - Level 1 as of v0.1 of the toolkit. Each of these are intended to add professionalism and ethical challenges to familiar scenarios.

How-To

As the instructor, feel free to use, incorporate, modify, and adjust any of the competitions in this section. More information about each is listed below:

Team Ethics & Professionalism – Hardening Competition. In an effort to make this versatile and useful for anyone who would like to use this toolkit, this may not be as immersive as a CCDC but should be given a similar gravitas. Teams will work to defend their box from the unknown, documenting steps taken along the way. As they are working, they may receive injections that should, at some point, go against policy and procedure. Students should raise alarm on this and hold the appropriate meetings with their supervisor or boss, as opposed to just blindly following. After they have spent the designated time working within their environment, a script will be run that checks for each inject to be completed (the malicious ones score negatively) and also for various hardening points (ports, firewall,



antivirus, etc., etc.). They will not receive their scores yet; the instructor will have a report though of an initial score based on what they did. Instructors can formulate questions around this or accept it as is. During debriefing, students have an opportunity to increase their score by discussing their steps and should it be found they performed hardening skills outside of the script check that improved the defense of the device or network they shall be awarded additional points. This, in essence, gives points for their professional reporting as their boss or CISO is more than likely not going to double check their work in the working environment.

Should you have the means to set up the environment and have actual attacks (for instance an upper-level pen test class or operations class), then by all means have them attack the environment as students are working. In those instances, allow students an appropriate amount of time based on skill level (such as an hour for moderately skilled students) to set up initial defenses. This is the most ideal of situations as it allows students to interact in a manner most similar to other CCDC and even some real-world incidents. If this is applicable to you, include a debrief from the red team so all students can learn from both sides. Regardless, ensure students understand the importance of documentation and thoroughly check their system. If you, the instructor, are setting up images or devices, be sure to leave intentional holes in security for your students to fix. Adjust the script accordingly to check for these as well.

Remember, while it is fun to have friendly competition, remind students that this is for their benefit and to improve their knowledge and abilities. Encourage them to help/support one another, and you may even be able to involve past competitors in competitions with new teams. The hope is that this gives you either a foundation for or a competition/challenge you can implement with a fair amount of ease. Of course, there are many more resources in the CAE community in this space. Be sure to reach out and check out the CAE community site!

Pivot Project Challenges -

The Pivot Project Challenges are a set of engaging tasks that have the students retrieving information through file carving, analyzing packets within Wireshark, understanding ports through Nmap and saving the animals using Digital Forensics. This was created by a collection of educators and launched by SANS Institute (more on these educators in the special thank section below). What remains of the Pivot Project have been added, slightly modified, to this section of the toolkit. It has been edited to make it a bit clearer and easier to use. The original documentation has been retained for reference, credit, and background information for the challenges.



Requirements are listed within the documents as well as walkthroughs and answers.

*Special thanks to Ed Skoudis for not only bringing the Pivot Project to our awareness but for helping us in retrieving the files for reuse. Mandy Galante for the Digital Forensics Challenge, Jeff Hanson for the File Carving & Nmap Challenge, and Sam Bowne for the Python Port Scanning Challenge.



Instructor Guide to Finishing School

Welcome!

Finishing School was once a way to measure one's preparedness to use their skills in the real world. These schools could range from a year, a month, a week, or even a few days. For the purposes of our toolkit, we are including a 2-day finishing school workshop that helps students solidify their understanding of the following: Professionalism, Ethics, Resumes & Interviewing.

At the conclusion of the 2-day workshop, students will have a minimum of a professional resume but also have an understanding of the importance of professionalism and ethics in the field and their career choices. They will also have practice in interviewing, particularly dealing with behavioral-based interviews using the STAR method.

Overview

The Finishing School is a 2-day workshop that covers the following material: Professionalism & Ethics (Day 1) and Resume & Interviewing (Day 2). Both are intended to solidify the skills and demonstrate competency in using them.

The finishing school may feel or seem like a review of how they have had to apply ethics and professionalism in their work. To a degree this is correct, however, the approach at this stage should be less of a teacher telling a student and more of a larger conversation involving peers and near-peers if necessary. Students attending the 2-day finishing school should have a resume ready and be able to talk about various parts of it. They should also be prepared to practice interviewing as well as tips for the job hunt. The finishing school also covers how to be an effective, ethical professional beyond the computer screen, which should serve students well in their career journey.

How-To

Day 1 covers professionalism and ethics. This will feature familiar material that was provided in the professionalism and ethics course within the toolkit. It is by no means a substitution for the entire course provided in this toolkit and should serve as a final examination of one's comfortability with the material presented. Day 1 is broken into two sessions: a morning session and an afternoon session. The morning session covers professionalism, soft skills, and employability skills. The module covers the importance of the skills and how they connect together.

The afternoon session focuses on ethics. This should solidify the importance of the work they will be doing or have chosen to go into. The afternoon session covers ethical principles, the



importance of being ethical behind the scenes, and trust. The material provided will explain each of these concepts and how they connect to the professionalism skills taught in the morning session. At the conclusion of these sessions, students will create their “Why” statement as well as their understanding of the importance of both professionalism and ethics within their chosen field or job.

Day 2 covers Resumes and Interviewing. Similar to Day 1, this can be held in a morning and afternoon session. The morning session will cover resumes, what to include, how to build them, and how to properly format resumes for your chosen job/field (federal resume vs private sector resume). It will include how to incorporate and talk about skills that the student has developed both technical and professional as well as understanding page limits.

The afternoon session will cover interviewing, particularly the STAR method. The STAR method (defined in the included appendix) allows students to not only talk about their skills from a theoretical standpoint, but from a practical perspective. When asked about parts of their resume in an interview, they can back up their experience with actual situations where those skills were needed/used. At the conclusion of Day 2, students will take part in a final interview with the instructor or a panel (designated by the instructor) that showcases the skills they have learned, obtained, and sharpened. Should the finishing school be completed remotely, they will take part in a virtual interview (material will be included in the interview virtually).

Like everything in the toolkit, feel free to modify or edit the presentation, assignments, and material as you see fit to fit the needs of the institution. Slide printout pages are provided if the instructor would like to share them, so students can focus on jotting down notes as opposed to the bullets on the slide.

STAR Method

The STAR method for the purposes of this finishing school stands for:

S – Situation

T – Task

A – Action

R – Result

In essence, this is the interviewee’s response to a behavioral-based question or a question about skills listed on one’s resume. The interviewee should feel comfortable and confident enough to not only define the skill but provide an example of when they used the skill to achieve some goal or task.



By responding in this way, the interviewer should be satisfied with the accuracy of the interviewee's resume and their ability to use the skills listed as well as their comfortability by discussing what they are capable of doing and how they do it.



Instructor's Guide to Links

Welcome!

Here you will find links to everything that you need for the toolkit!

These links should have the most up to date information/items should you need them beyond what the toolkit provides. Beyond that, it will also have additional links we believe may be useful for your efforts!

Overview

This section of the toolkit includes direct links to various works being done or completed in the CAE community. Additional resources may be found here as they are approved for future versions of the toolkit.

How-To

It's odd just saying click the link for a toolkit geared towards helping to build/educate ethical cybersecurity professionals. So, we won't say that...but we do work to ensure that the links provided are legitimate and backed by the CAE community.



Instructor's Guide for Professionalism & Ethics Course

Welcome!

You may be asking: "Why is a whole course here?" Well, this is something that was developed to be usable almost immediately with minor tweaks and changes for your needs.

You are welcome to use the course as is, you are welcome to change it, edit it and make it your own, but what we want is for the spirit of the course to be there. The goal of this course is to help develop and support your students as they become professionals getting ready to enter the working world. We feel that this can be done! But you can add whatever you see it needs. It will be edited over time as most things in this toolkit. So please provide us with feedback and let us know how we can continue to improve this. We aren't looking for personal recommendations, again, you can make it as fancy or unique as you want. We are looking for general edits to make the foundation more solid.

Overview

This course was built for a 1 credit hour 16-week course that meets once a week for an hour. It was built for in-person/face-to-face instruction but can be changed to online or hybrid. It includes 14 micromodules covering a range of topics:

1. Lifelong Learning
2. 7 Essential Life Skills
3. Vision & Why
4. Procrastination & Discernment
5. Job Readiness
6. Communication & Listening
7. Personal Brand
8. Cover Letter & Resume
9. Networking
10. Ethics
11. Time Management
12. Master Calendar
13. Professional Conversation & Etiquette
14. Developing Interview Skills

The course is outlined in a way that starts by focusing on students' personal development and understanding what it takes to not just get a job but build a career. It then leads to how to land a job and start the career journey. Within the second part (6-14), students will continue to develop



their own ethics, time management, and etiquette. It was ordered in this way to help students understand that they should not just become complacent in their role but to actively continue to learn and build their skills and abilities.

How-To

This course is fully built with a syllabus and instructor guide. It includes textbooks, assignments, lesson plans, and materials. It is ready to be implemented as is but can be modified to fit the institutions' needs and/or goals. Feel free to expand the topics, change assignments, assigned readings, etc. With changes, we do advise that you review the material to ensure that it matches or supports any changes made to the course.

*Special thanks to Greg Sayadian of Montreat College for his excellent work on building this course and materials



Instructor's Guide to Supplemental Material

Welcome!

The materials found in this folder are included to help in bettering students' understanding of the material they are working with and the field they are working in.

As of now, there are a series of animated videos that discuss the NICE Framework in a way that may help students understand it better. Instructors are allowed to use supplemental material as needed.

Overview

The material here aims to provide support for a wide variety of things. This section will be added to and may be organized differently as more things are added and organized.

How-To

The material here may be used as supplemental to any needs the organization needs or would like to include. Feel free to use these as you see fit.



Instructor's Guide to Workshops

Welcome!

This section of the toolkit includes workshops that have been developed and put into use. The guides, material, and sources here are free for you to modify, edit, and use as you see fit. The aim is to give you a foundation to allow you to create workshops that fit your needs and possibly your audience.

Overview

As of v3, there are six workshops present within each folder. Three for college workshops and three for high school workshops. These workshops can be modified, added to, or used as is for workshops on campus and for outreach to high schools.

College:

- **Ethics in Cyber:** focuses on developing ethics as well as the impact ethics has had on the field. Ethics in cyber is more than just following policies or rules; it deals with the character of the individual.
- **Professionalism in Cyber:** focuses on what it means to be a professional in the field of cybersecurity. Professionals are not just people with degrees; they are people who act and behave in a manner that is beneficial, supportive, and productive to themselves, others, and the business itself.
- **Women in Cybersecurity:** This workshop will be geared towards women in cybersecurity (specifically cyber defense). It aims to provide resources to further their skills, ethical and professional challenges, as well as ways to become more involved in the community.

High School:

- **Cybersecurity Professionalism & Ethics:** tackles both professionalism and ethics for a high school audience. Particularly in how students can begin to build professional skills and habits as well as ethical approaches to situations and dilemmas.
- **Professionalism in a Modern Age:** Highlights how different this era is in its information and knowledge gathering. It aims to bring awareness to actions beyond just school and how that may impact the future. The workshop aims to promote critical thinking in high schoolers to think beyond the now and to really consider actions that they may take into consideration their future.
- **Girls Hacking the Future:** This workshop will be geared towards high school girls who may be interested in or already in the cyber field. The hope is that it will not only



encourage more involvement but let them know that they are not alone and introduce them to resources, mentors, and other ways to build their skills now.

How-To

Material is being added as well as presentations that can be used for each session. Outlines are provided with suggested times and pacing tips, but this is by no means a requirement and can be changed to conform with any requirements.

The goal of these workshops is to inform, give experience, and encourage students at all levels to begin, continue, or further their understanding of the field.

Within each Folder you will find:

- Materials Folder (if applicable)
- Slides for the Workshop
 - Activities are within the slides referencing material as needed
 - Sources and links are also located within the slides as well as the respective Instructor's Guide
- Instructor's Guide
- Slides Outline (if you'd like to make plans with it or share it with attendees to promote engagement and less notetaking. Your theories on that and how you wish to do the workshop is entirely up to you)

Each folder has everything you need to run in any of the workshops. They are geared towards ethical and professional development within the attendees. There are 2 workshops, at current, geared towards promoting and encouraging women in cybersecurity (and STEM in general). Feel free to modify these, run these as needed and/or make edits/improvements.

My only ask is that if you run a workshop and identify ways to improve it or have an outstanding workshop using these or making these the foundation, that you gather feedback, report back so we can improve it for all.

Thank you for taking time to go through these, and I hope you find some that you want to run or use!

